Quality Engineering: A Journal Dedicated to Quality Improvement Methods and Applications

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Call for Papers

- **Special Issue on "Statistical Engineering" in *Quality Engineering***

- The objective of the issue is to invite contributions from the community of researchers, practitioners and academicians to provide examples, insight and research in the following areas:

  - Case studies demonstrating the development, process and results of the successful implementation of Statistical Engineering in a broad spectrum of different applications, including but not restricted to industry, manufacturing, service, financial, and healthcare

  - Implementation strategies to incorporate Statistical Engineering into the graduate and undergraduate Statistics program curricula

- ***Consider submitting a paper***

  - ***Handouts provided at this symposium on the how, when, where, what, and who!***

Purpose

- First issue: 1988
- Currently in Volume 23 (published quarterly)
- *Directed to* practitioners and researchers.
- *Devoted to* publication of original quality engineering solutions.
- Publish:
  - new methods ready for immediate application
  - novel uses of standard methods

Original Intentions…

Quality Engineering is a magazine devoted to articles which tells persons dealing with Quality problems how others have addressed similar situations and what was done. The message should be "What the problem was, how we solved it, and what the results were."

- Articles geared towards manufacturing-related issues.
- Journal was an outgrowth of the quality problems industry faced in the 1980s; collaboration between Marcel Dekker, Inc. and ASQC.

First Issue of QE

- "Do we need new machines? A p-chart and regression study" *Gerald B. Heyes*
- "New product introduction and quality program management" *James T. Zurn*
- "An application of fractional factorial experimental designs" *Mary B. Kilgo*
- "Management, measurement, and analysis of the supplier base" *Glenn Roth*
- "An approach for development of specifications for quality improvement" *Kailash C. Kapur*
- "New directions for reliability" *James R. King*
- "Nondestructive crimp verification" *James R. Simmonds*
- Variable gauge repeatability and reproducibility study using the analysis of variance method" *Pingfang Tsai*

Editors

- Frank Caplan, Founding Editor
  - Served for 17 years
- David Lyth
- James Simpson
- Geoff Vining
- Connie Borror
- Peter Parker (beginning January 2013)

QE Sections

- Original Articles
- *Quality Quandries*
- *Statistical Standards*
- *Technical Advice (new)*
- *Reliability Section (new)*
  - *We need more articles here*
  - *The Reliability Division of ASQ gives a $1000 award for the best reliability paper in QE each year.*

1988-2005

Certified quality engineer–Body of knowledge categories		
No.	**Category description**	**%**
I.	Management and leadership in quality engineering	14.8
II.	Quality systems development, implementation, and verification	1.7
III.	Planning, controlling, and assuring product and process quality	17.6
IV.	Reliability and risk management	4.6
V.	Problem solving and quality improvement	4.6
VI.	Quantitative methods	56.7

Booker, B. and Lyth, D. (2006). Editorial: "*Quality Engineering* from 1988 through 2005; Lessons from the Past and Trends for the Future". Quality Engineering pp. 1-4.

1988-2005

Quantitative methods		
VI.	Sub-category description	%
a.	Concepts of probability and statistics	1.8
b.	Collecting and summarizing data	4.6
c.	Properties and applications of probability distributions	4.1
d.	Statistical decision-making	3.2
e.	Measuring and modeling relationships between variables	12.0
f.	Designing experiments	27.9
g.	Statistical process control (SPC)	34.2
h.	Analyzing process capability	12.4
i.	Concepts of probability and statistics	1.8

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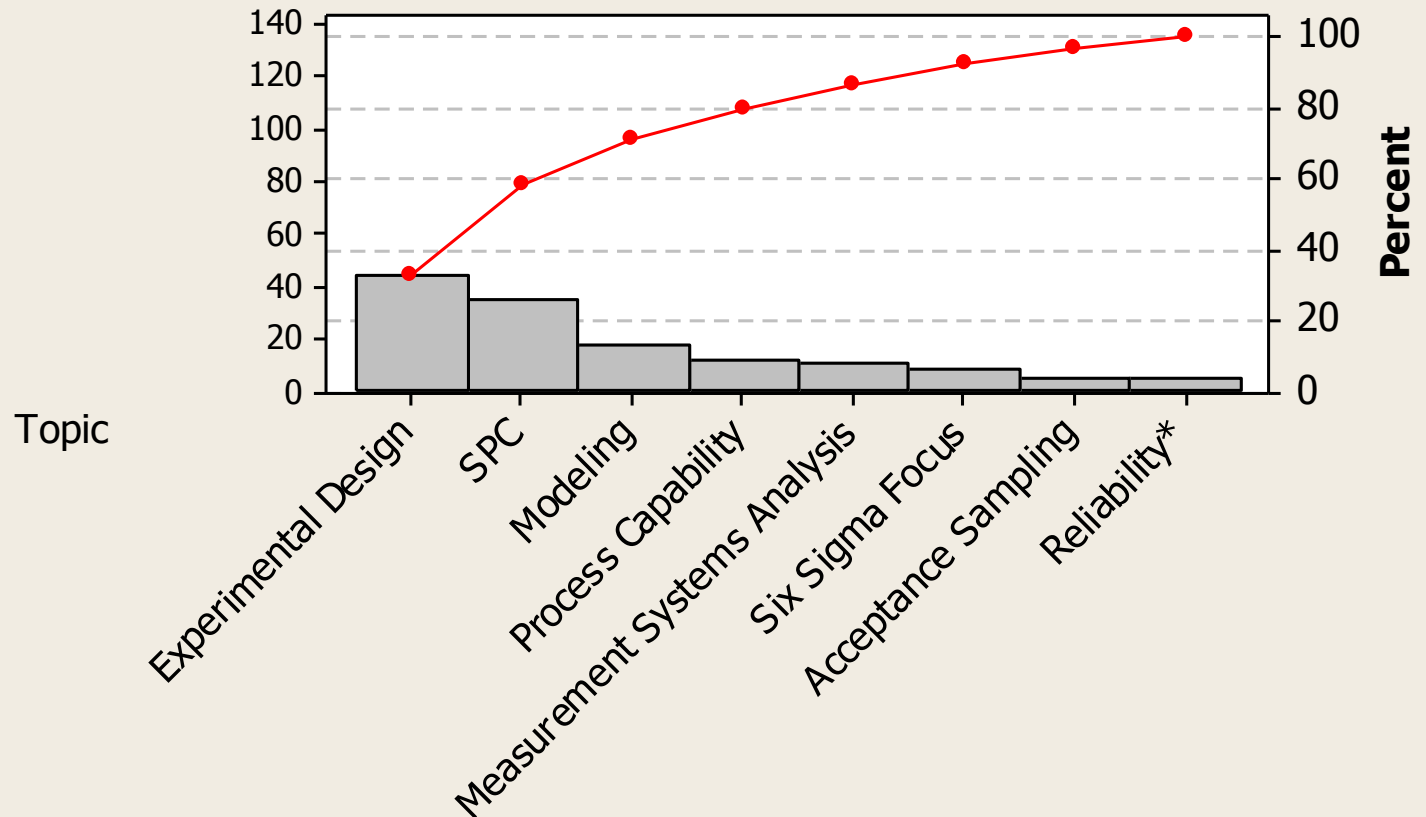
Topics

(2006-2010; 5 Volumes)

N = 152

$R^+ = 3$

Pareto Chart of Topic

	Experimental Design	SPC	Modeling	Process Capability	Measurement Systems Analysis	Six Sigma Focus	Acceptance Sampling	Reliability*	
Number of Articles	44	35	17	11	10	8	5	5	= 135
Percent	32.6	25.9	12.6	8.1	7.4	5.9	3.7	3.7	
Cum %	32.6	58.5	71.1	79.3	86.7	92.6	96.3	100.0	

Articles

- Original research
- Novel applications
- Tutorials
- Review papers
- Discussion papers
- Historical
- "Conversation series"

What do we need?

- Collaboration among different fields and expertise

In academia:

- When times are good: (these are turtles):
  We're happy collaborators

Engineering   Math/statistics   Business   Chemistry/Biology
....

http://freeturtle.net/freeturtle

What do we need?

- Collaboration among different fields and expertise is necessary

In academia:

- When times are bad, we have to be careful: (these are turtles also):


Engineering

Math/statistics

Business

Chemistry/Biology ….

We "turtle up"

http://freeturtle.net/freeturtle

# Collaboration

- Best methods + Software = Useful + Used

Maciejewski, Rudolph, Hafen, Abusalah, Yakout, Ouzzani, Cleveland, Grannis, and Ebert, (2010). "Visual Analytics Approach to Understanding Spatiotemporal Hotspots". *IEEE Transactions on Visualization and Computer Graphics*
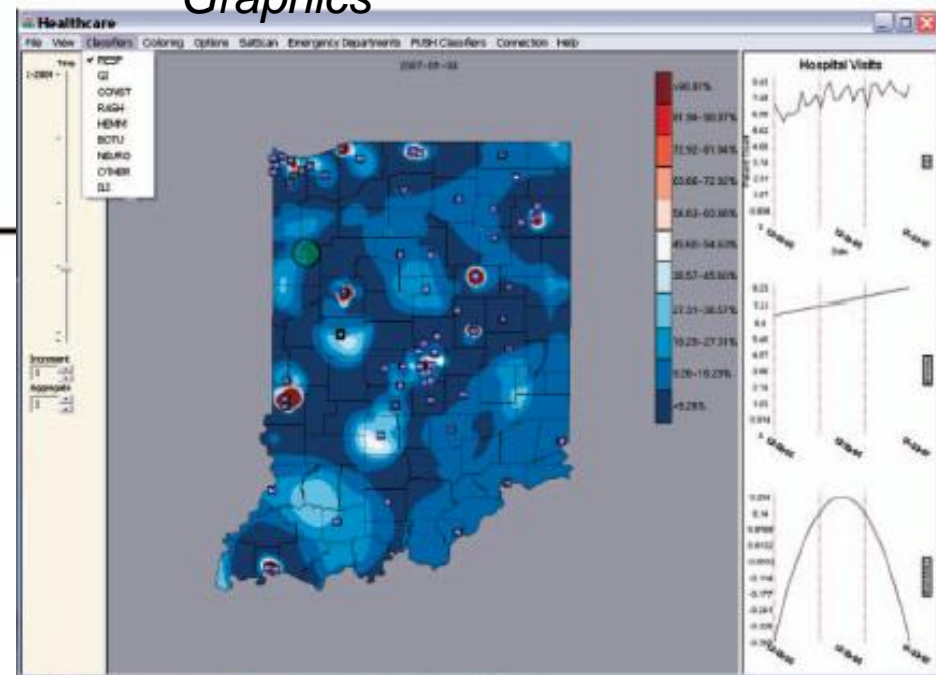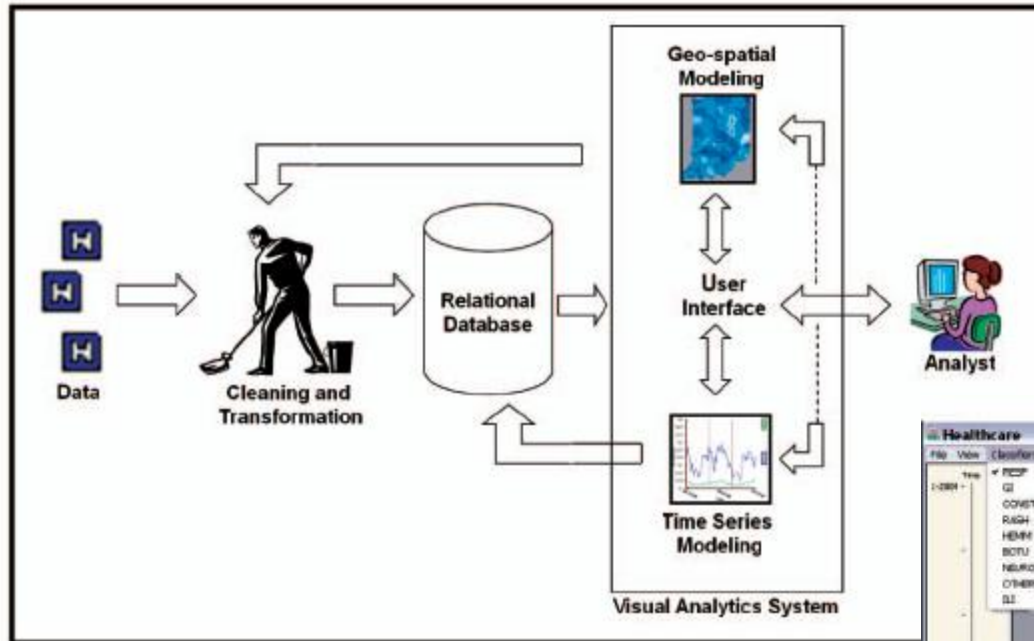
Collaboration

- Best methods + Software = Useful + Used

Maciejewski, Rudolph, Hafen, Larew, Mitchell, Cleveland, and Ebert, (2010). "Forecasting Hotspots – A Predictive Analytics Approach". *IEEE Transactions on Visualization and Computer Graphics*
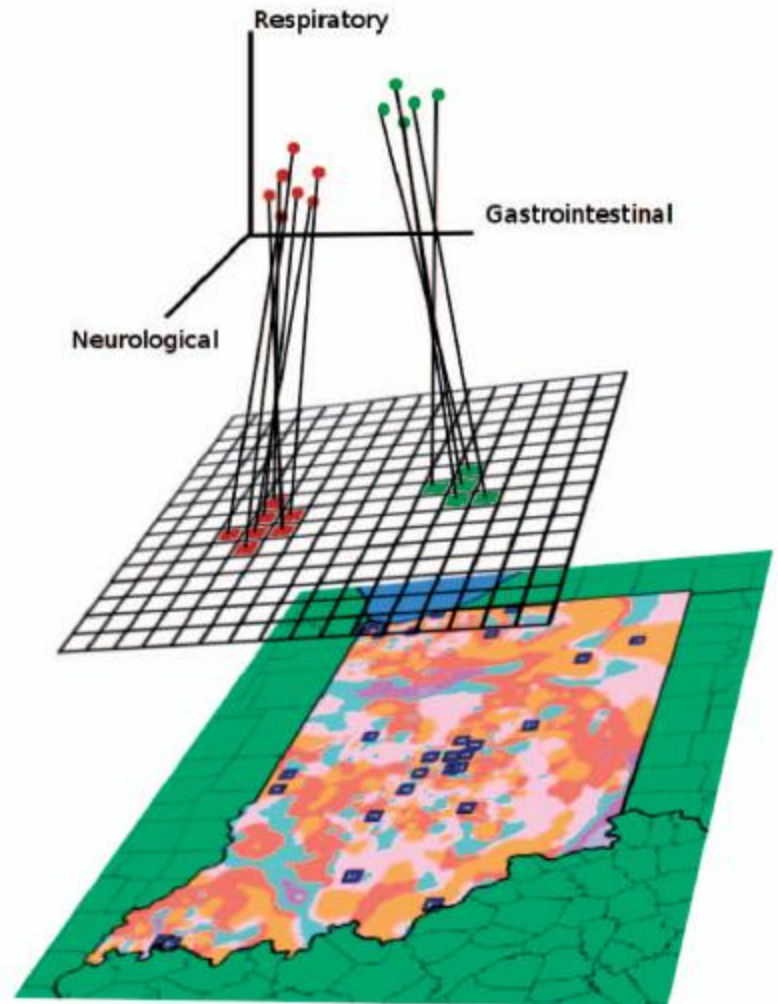
What do we want in QE?

- ## Every so often, we need
  - Bibliographies
  - Basic review articles

- ## Immediate need (want?)
  - Basic review of reliability techniques and methods
  - Providing references for "where to start"

- ## Software reviews/guidance

- ## What's it called in that field?
  - Key to guiding students as well as practitioners
  - Requires collaboration among experts in these various fields

Quality Engineering

- Fills a much needed niche

- Outlet for innovative collaborations

- By its original intent, QE embodies "statistical engineering"

- Teaching tool

Quality Engineering

- No matter what the application or field of interest, *QE* articles demonstrate:

  "*What the problem was, how we solved it, and what the results were.*"

- I would like to dedicate this presentation in memory of a beloved leader in this field and unfailing supporter of *QE*, Dr. Soren Bisgaard.